

ENVIRONMENTAL CONSEQUENCES

METHODOLOGY FOR ASSESSING IMPACTS

Potential impacts are described in terms of type (are the effects beneficial or adverse?), context (are the effects site specific, local, or even regional?), duration (are the effects short term, lasting less than one year, or long- term, lasting more than one year?), and intensity (are the effects negligible, minor, moderate, or major?). Because definitions of intensity vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this GMP revision.

IMPAIRMENT OF NATIONAL PARK RESOURCES

The National Park Service Organic Act of 1916 states that the National Park Service

... shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified . . . by such means and measures as conform to the fundamental purpose of the said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations (emphasis added).

In addition to avoiding impairment, NPS managers must seek ways to avoid, or minimize to the greatest degree practicable, adverse impacts on preserve resources and values. However, laws do give NPS managers discretion to allow certain impacts to preserve resources and values when necessary and appropriate to fulfill the purposes of a preserve, as long as the impact does not constitute impairment of the affected resources and values (NPS 2003c).

NPS *Management Policies 2006* assign determinations of impairment to the responsible manager and only direct that an action should be considered to constitute impairment if, in the manager's professional judgment, the action "would harm the integrity of the resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values."

An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the preserve
- key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve

- identified as a specific goal in the preserve's GMP or other relevant NPS planning documents

Director's Order – 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making*, states that environmental documents will evaluate and describe impacts that may constitute an impairment of preserve resources or values. An assessment of impairment is made in the "Environmental Consequences" section of this document for historic structures, cultural landscapes, soils, vegetation, wildlife, threatened and endangered species, and scenic quality. By means of NPS *Interim Technical Guidance on Assessing Impacts and Impairment to Natural Resources* (NPS 2003c), these statements assess whether impairment is *likely to occur* or *not likely to occur* for each resource type (statements are not required for nonresource impact topics). In addition, a comprehensive concluding statement regarding whether impairment *will result* is made at the end, which considers all anticipated impacts.

Cumulative Impacts

The Council on Environmental Quality regulations, which implement NEPA, require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions." Cumulative impacts are considered for both the no-action and preferred alternatives.

Cumulative impacts were determined by combining the impacts of the alternatives with other past, present, and reasonably foreseeable future projects or actions in or around Tallgrass Prairie National Preserve. Past actions include historic land use and urban development around the preserve, and conversion of tallgrass prairie to agricultural land on an immense scale from an ecosystem perspective. Recently completed projects include installation of a new water supply line for the preserve and installation of the Bottomland Trail. Foreseeable future actions include a small expansion (roughly 1.5 acres) of St. Anthony Cemetery, which is located in the immediate area of the alternative sites for new facilities, highway construction and maintenance, trail construction and maintenance, watershed and stock pond development, stream alterations, de-watering, land management, and introduction of nonnative species.

Impacts to Cultural Resources / Section 106 of the National Historic Preservation Act

In this GMP revision, impacts to cultural resources are described in terms of type, context, duration, and intensity, which is consistent with the regulations of the Council on Environmental Quality that implement NEPA. These impact analyses are intended, however, to comply with the requirements of both NEPA and section 106 of the National Historic Preservation Act. In accordance with the Advisory Council on Historic Preservation's regulations implementing section 106 of the National Historic Preservation Act (36 CFR 800, *Protection of Historic Properties*), impacts to cultural resources were also identified and evaluated by (1) determining the area of potential effects; (2) identifying cultural resources

present in the area of potential effects that are either listed in or eligible to be listed in the NRHP; (3) applying the criteria of adverse effect to affected NRHP- eligible or - listed cultural resources; and (4) considering ways to avoid, minimize, or mitigate adverse effects.

Under the Advisory Council's regulations, a determination of either *adverse effect* or *no adverse effect* must also be made for affected NRHP- listed or eligible cultural resources. An *adverse effect* occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the NRHP, e.g., diminishing the integrity (or the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects of the alternatives that would occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5, *Assessment of Adverse Effects*). A determination of *no adverse effect* means there is an effect, but the effect would not diminish the characteristics of the cultural resource that qualify it for inclusion in the NRHP.

Council on Environmental Quality regulations and National Park Service *Conservation Planning, Environmental Impact Analysis, and Decision- making* (Director's Order – 12) also call for a discussion of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g., from major to moderate. Any resultant reduction in the intensity of an impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect, as defined by section 106, is similarly reduced. Cultural resources are nonrenewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under section 106 may be mitigated, the effect remains adverse.

A section 106 summary is included in the applicable impact analysis sections. This summary is an assessment of the effect of the undertaking (implementation of the alternative) on NRHP- eligible or - listed cultural resources only, based on the criterion of effect and criteria of adverse effect found in Advisory Council regulations.

CRITERIA AND THRESHOLDS FOR IMPACT ANALYSIS

Impact analyses and conclusions are based on a review of existing literature and preserve studies, information provided by preserve staff, professional judgments and insights of other agencies and officials, and input from interested local tribes and the general public. Definitions are used to evaluate the context, duration, and intensity. Environmental consequences are evaluated based on the adoption of the mitigation measures outlined in the "Alternatives" section of this document, where applicable, laws, regulations, and/or guidance that relates to the evaluation of each impact topic are identified.

Context is the setting within which impacts are analyzed such as the affected region, society as a whole, the affected interests, and/or a locality. In this GMP revision, the intensity of impacts is evaluated within a local (i.e., project area) context, while the

intensity of the contribution of effects to cumulative impacts are evaluated in a regional context.

Duration is the time period for which the impacts are evident. Short- term impacts are those that are noticeable during the project and six months thereafter. Long- term impacts are those that are evident for periods longer than one year after the project has been completed.

For this analysis, *impact intensity* or severity is defined for each impact topic using a table format.

Historic Structures

The National Historic Preservation Act and NEPA require consideration of impacts on historic structures and buildings listed in or eligible for listing in the NRHP.

The historic Spring Hill / Z Bar Ranch Headquarters ranch house was listed in the NRHP in 1971. In order for a building to be listed in the NRHP, it must be associated with an important historic context and possess historic integrity of those features necessary to convey its significance, i.e., location, design, setting, workmanship, materials, feeling, and association. The entire preserve property was listed as a national historic landmark in 1997. Potential impacts were determined by considering to what degree historic integrity and character-defining features would be affected by the alternatives.

Impact Indicators, Criteria, and Methodology

For purposes of analyzing potential impacts of historic structures, the thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Definition
Negligible	Impact is at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for section 106 would be <i>no adverse effect</i> .
Minor	<p>Adverse Impact – alteration of a pattern(s) or feature(s) would not diminish the overall integrity of the resource. The determination of effect for section 106 would be <i>no adverse effect</i>.</p> <p>Beneficial Impact – stabilization/preservation of features and landscape patterns in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i> and/or the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i>. The determination of effect for section 106 would be <i>no adverse effect</i>.</p>

Impact Intensity	Intensity Definition
Moderate	<p>Adverse Impact – alteration of a pattern(s) or feature(s) would diminish the overall integrity of the resource. The determination of effect for section 106 would be <i>adverse effect</i>. A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation, in accordance with 36 CFR 800.6(b). Measures identified in the memorandum of agreement to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.</p> <p>Beneficial Impact – rehabilitation of a structure, landscape, or its patterns and features in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i> and/or the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i>. The determination of effect for section 106 would be <i>no adverse effect</i>.</p>
Major	<p>Adverse Impact – alteration of a pattern(s) or feature(s) would diminish the overall integrity of the structure or landscape. The determination of effect for section 106 would be <i>adverse effect</i>. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/or Advisory Council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).</p> <p>Beneficial Impact – restoration of a structure, landscape, or its patterns and features in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i> and/or <i>Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i>. The determination of effect for section 106 would be <i>no adverse effect</i>.</p>

Archeology

The National Historic Preservation Act, NEPA, and NPS *Management Policies* 2006 require consideration of impacts on archeological resources listed in or eligible for listing in the NRHP.

The actual physical material of cultural resources can only answer certain important research questions about human history. Archeological resources have the potential to answer, in whole or in part, such research questions. An archeological site(s) can be eligible to be listed in the NRHP if the site(s) has yielded, or may be likely to yield, information important in prehistory or history. An archeological site(s) can be nominated to the NRHP in one of three levels of significance: local, state, or national.

For purposes of analyzing impacts to archeological resources, thresholds of change for the intensity of an impact are based on the potential of the site(s) to yield information important in prehistory or history, as well as the probable historic context of the affected site(s). Following are the impact threshold definitions for archeological resources:

Impact Intensity	Intensity Definition
Negligible	Impact is at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for section 106 would be <i>no adverse effect</i> .
Minor	<p>Adverse Impact – Disturbance of a site(s) results in little, if any, loss of integrity. The determination of effect for section 106 would be <i>no adverse effect</i>.</p> <p>Beneficial Impact – Maintenance and preservation of a site(s). The determination of effect for section 106 would be <i>no adverse effect</i>.</p>
Moderate	<p>Adverse Impact – Disturbance of a site(s) results in loss of integrity. The determination of effect for section 106 would be <i>adverse effect</i>. A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the memorandum of agreement to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.</p> <p>Beneficial Impact – Stabilization of a site(s). The determination of effect for section 106 would be <i>no adverse effect</i>.</p>
Major	<p>Adverse Impact – Disturbance of a site(s) results in loss of integrity. The determination of effect for section 106 would be <i>adverse effect</i>. Measures to minimize or mitigate adverse impacts cannot be agreed on and the National Park Service and applicable state or tribal historic preservation officer and/or Advisory Council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).</p> <p>Beneficial Impact – Active intervention to preserve a site(s). The determination of effect for section 106 would be <i>no adverse effect</i>.</p>

Cultural Landscapes

The National Historic Preservation Act and NEPA require consideration of impacts on cultural landscapes listed in or eligible for listing in the NRHP.

As described by the National Park Service *Cultural Resource Management Guideline* (Director's Order – 28), a cultural landscape is

... a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions.

Cultural landscapes within the preserve have been identified. The entire preserve property was listed as a national historic landmark in 1997. Potential impacts were determined by considering to what degree historic integrity and character- defining features would be affected by the alternatives. For purposes of analyzing potential impacts to cultural landscapes, the thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Definition
Negligible	Impact is at the lowest levels of detection with neither adverse nor beneficial consequences. The determination of effect for section 106 would be <i>no adverse effect</i> .
Minor	<p>Adverse Impact – alteration of a pattern(s) or feature(s) would not diminish the overall integrity of the resource. The determination of effect for section 106 would be <i>no adverse effect</i>.</p> <p>Beneficial Impact – stabilization of features and landscape patterns in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i> and/or <i>Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i>. The determination of effect for section 106 would be <i>no adverse effect</i>.</p>
Moderate	<p>Adverse Impact – alteration of a pattern(s) or feature(s) would diminish the overall integrity of the resource. The determination of effect for section 106 would be <i>adverse effect</i>. A memorandum of agreement is executed among the National Park Service and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation, in accordance with 36 CFR 800.6(b). Measures identified in the memorandum of agreement to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.</p> <p>Beneficial Impact – rehabilitation of a structure, landscape, or its patterns and features in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i> and/or <i>Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i>. The determination of effect for section 106 would be <i>no adverse effect</i>.</p>
Major	<p>Adverse Impact – alteration of a pattern(s) or feature(s) would greatly diminish the overall integrity of the structure or landscape or remove overall integrity of the structure or landscape. The determination of effect for section 106 would be <i>adverse effect</i>. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the National Park Service and applicable state or tribal historic preservation officer and/or Advisory Council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).</p> <p>Beneficial Impact – preservation or restoration of a structure, landscape, or its patterns and features in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i> and/or <i>Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i>. The determination of effect for section 106 would be <i>no adverse effect</i>.</p>

Soils

Analyses of potential impacts on soils were derived from available information regarding natural systems and soils in and near Tallgrass Prairie National Preserve, as well as preserve staff observations about the effects of visitor use and construction on soils to date. The thresholds of change for the intensity of impacts to soils are defined as follows:

Impact Intensity	Intensity Definition
Negligible	The impact to soil formation or erosion processes is at the lowest levels of detection based on standard scientific methodologies. Impacts are well within natural variability.
Minor	The impact to soil formation or erosion processes is detectable, but slight. Impacts are expected to remain within the range of natural variability, possibly showing small, short-term disruptions in soil formation or erosion processes that are within natural variability.
Moderate	The impact to soil formation or erosion processes is readily apparent. Impacts are expected to be outside the range of natural variability for short periods of time. Disruptions within the range of natural variability may be long term. Disruptions to key processes are expected to be short term and temporarily outside the range of natural variation.
Major	The impact to soil formation or erosion processes is substantial, or involves widespread loss. Impacts are expected to be outside the range of natural variation for short to long periods of time, or may even be permanent. Disruptions within the range of natural variation may be long term. Disruptions to key processes may be long term or permanent.

Prime and Unique Farmlands

The impact intensity thresholds for impacts to prime and unique farmlands and also applicable to farmlands of statewide importance are as follows:

Impact Intensity	Prime and Unique Farmlands Intensity Definition
Negligible	The impact to prime and unique farmlands is at the lowest levels of detection, not perceptible, and not measurable.
Minor	The impact to prime and unique farmlands would be noticeable, but would not alter the function of the farmland or the criteria for which it is considered prime or unique.
Moderate	The impact to prime and unique farmlands would be noticeable and may alter the function of the farmland or the criteria for which it is considered prime or unique.
Major	The impact to prime and unique farmlands would be readily apparent and would alter the function of the farmland or the criteria for which it is considered prime or unique.

Vegetation

Analyses of potential impacts on vegetation and the tallgrass prairie community were based on available information about floral communities and the extent to which these communities are affected by facility construction and construction-related activities. For purposes of analyzing potential impacts, the thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Definition
Negligible	Impacts occur, but are minimal and have no observable effects on plant communities.
Minor	Impacts are detectable, but the severity and timing of changes are not expected to be outside the range of natural variability and not expected to have any long-term effects on plant communities.
Moderate	Impacts are detectable and the severity and timing of changes are expected to be outside the range of natural variability for short periods of time and changes within natural variability may be long term. Plant species are not at risk of being extirpated from the preserve.
Major	Impacts are detectable and the severity and timing of changes are expected to be outside the range of natural variability for short to long periods of time—or may even be permanent. Changes within the range of natural variability may be long term or permanent. In extreme cases, plant species may be extirpated from the preserve.

Threatened and Endangered Species

The Endangered Species Act of 1973 (16 USC 1531 *et seq.*), as amended, mandates that all federal agencies consider the potential effects of their actions on species listed as threatened or endangered. If the National Park Service determines that an action may adversely affect a federally listed species, consultation with the USFWS is required to ensure that the action would not jeopardize the species' continued existence or result in the destruction or adverse modification of critical habitat. NPS *Management Policies* 2006 state that potential effects of agency actions would also be considered for state or locally listed species.

Known impacts caused by development and human use were also considered. The thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Definition
Negligible	No federally listed species would be affected or the alternative would affect an individual of a listed species or its critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population. Negligible effect would equate with a "no effect" determination in USFWS terms.
Minor	The alternative would affect an individual(s) of a listed species or its critical habitat, but the change would be small. Minor effect would equate with a "may affect" determination in the USFWS terms and would be accompanied by a statement of "likely..." or "not likely to adversely affect" the species.
Moderate	An individual or population of a listed species or its critical habitat would be noticeably affected. The effect could have some long-term consequence to the individual, population or habitat. Moderate effect would equate with a "may affect" determination in USFWS Service terms and would be accompanied by a statement of "likely..." or "not likely to adversely affect" the species.

Impact Intensity	Intensity Definition
Major	An individual or population of a listed species or its critical habitat would be noticeably affected with a long-term, vital consequence to the individual, population, or habitat. Major effect would equate with a “may affect” determination in USFWS terms and would be accompanied by a statement of “likely...” or “not likely to adversely affect” the species or critical habitat.

Wildlife

Analyses of potential impacts to wildlife were based on available information about faunal communities and the extent to which these communities are affected by facility construction, habitat loss, and construction- related activities. For purposes of analyzing potential impacts, the thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Definition
Negligible	Impacts occur, but are minimal and have no observable effects on wildlife and habitats.
Minor	Impacts are detectable, but the severity and timing of changes are not expected to be outside the range of natural variability and not expected to have any long-term effects on wildlife resources or habitats. Population numbers, population structure, genetic variability, and other demographic factors for wildlife species may have small, short-term changes, but long-term characteristics remain stable. Key habitat processes may have short-term disruptions that are within natural variability, and habitats remain functional.
Moderate	Impacts are detectable and the severity and timing of changes are expected to be outside the range of natural variability for short periods of time and changes within natural variability may be long term. Population numbers, population structure, genetic variability, and other demographic factors for wildlife species may have small to moderate declines, but rebound to pre-impact numbers. Species are not at risk of being extirpated from the preserve, key habitat processes may have short-term disruptions that are outside natural variability (but return to natural variability), and habitats remain functional.
Major	Impacts are detectable and the severity and timing of changes are expected to be outside the range of natural variability for long periods of time—or may even be permanent. Changes within the range of natural variability may be long term or permanent. Timing of the impacts is important with respect to wildlife species or habitat function. Population numbers and structure, genetic variability, and other demographic factors for species may experience long-term declines and long-term depressed population numbers. In extreme cases, wildlife species may be extirpated from the preserve, key habitat processes may be disrupted, or habitats may be rendered nonfunctional.

Visitor Experience/Appreciation

National Park Service, The Nature Conservancy, and the Kansas Park Trust staff observations of the following were the basis for determining potential impacts of each alternative: visitation patterns, ability of visitors to effectively experience and understand preserve resources, and extent to which visitors enjoy their visit to the preserve. For purposes of analyzing potential impacts, the thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Definition
Negligible	The impact could affect visitor use, but the change would be so small that it would not be of any measurable or perceptible consequence and/or would affect few people.
Minor	The impact could affect visitor use, but the change would be slight and localized, with few measurable consequences, and/or would affect some people. The impact could be beneficial or adverse.
Moderate	The impact would result in readily apparent adverse or beneficial changes to visitor use with measurable consequences, and/or an effect on a large number of people.
Major	The impact would have a substantial adverse or beneficial effect on visitor use, and/or would affect the majority of people.

Scenic Quality

Key views and vantage points were identified from the 2000 GMP (NPS 2000a). Field observations of key views and viewsheds by National Park Service, The Nature Conservancy, and Kansas Park Trust staff were the primary basis for determining potential impacts of each alternative. Computer-generated viewshed analyses were used to substantiate which areas can be seen from key viewpoints, and conversely, which areas are blocked from view by intervening hills. For purposes of analyzing potential impacts, the thresholds of change for the intensity of an impact are defined as follows:

Impact Intensity	Intensity Definition
Negligible	The impact to visual resources is at the lowest levels of detection, barely perceptible and not measurable.
Minor	The impact to visual resources would be noticeable, but would not alter the feeling, character, or setting associated with the views of or from the preserve.

Impact Intensity	Intensity Definition
Moderate	The impact to visual resources would be more noticeable and may alter the feeling, character, or setting associated with the views of or from the preserve. Impacts can be adverse or beneficial.
Major	The impact to visual resources would be readily apparent and would alter the feeling, character, or setting associated with the views of or from the preserve. Impacts can be adverse or beneficial.

Water Quality

Water quality information was compiled from existing research reports, planning documents, and consultation with preserve specialists. Several elements were considered to determine impacts including: water rights, surface and groundwater hydrology, surface and groundwater quality and quantity, topography, and existing land use. Specific impact elements are discussed in relation to each assessed alternative. Thresholds to determine water quality impacts are defined as follows:

Impact Intensity	Intensity Definition
Negligible	The impact is barely detectable or would result in no measurable or perceptible changes in water quality.
Minor	Impacts would be measurable and localized to specific stream channels and would involve sources of pollution that do not persist in the environment.
Moderate	Impacts would be clearly detectable, would cause an appreciable change in water quality in a localized area, and would involve sources of pollution that persist in the environment.
Major	Impacts would be regional or watershed-wide and would involve sources of pollution that are persistent in the environment.

Floodplains

The planning team based the impact analysis and the conclusions for possible impacts to floodplains using on- site inspections of known and potential impacts to floodplains. Conclusions and possible impacts were also based on review of existing literature and studies, information provided by experts in the National Park Service, preserve staff, and other agencies' insights and professional judgment. The thresholds of change for impact intensity are defined as follows:

Impact Intensity	Floodplains Intensity Definition
Negligible	There would be no change in the ability of a floodplain to convey floodwaters or its values and functions. Projects would not contribute to flood flows.
Minor	Changes in the ability of a floodplain to convey floodwaters, or its values and functions, would be measurable and local. Projects would not contribute to flood flows. No mitigation would be needed for floodplain impacts.
Moderate	Changes in the ability of a floodplain to convey floodwaters or its values and functions would be measurable and local. Projects could contribute to flood flows. The impact could be mitigated by modification of proposed facilities in the floodplain.
Major	Changes in the ability of a floodplain to convey floodwaters or its values and functions would be measurable and widespread. Projects would contribute to flood flows. The impact could not be mitigated by modification of proposed facilities.

Preserve Operations

National Park Service, The Nature Conservancy, and Kansas Park Trust staff knowledge regarding operational efficiency was used to determine the intensity levels of potential impacts. For purposes of analyzing potential impacts, the threshold of change is defined as follows:

Impact Intensity	Intensity Definition
Negligible	The impact could change the preserve maintenance operations, but the change would be so small that it would not be of any measurable or perceptible consequence.
Minor	The impact could change the preserve maintenance operations, but the change would be slight and localized, with few measurable consequences.
Moderate	The impact would result in readily apparent changes to preserve maintenance operations with measurable consequences.
Major	The impact would result in a substantial adverse or beneficial change in preserve maintenance operations.

ENVIRONMENTAL CONSEQUENCES—NO-ACTION ALTERNATIVE

Historic Structures

Under the no- action alternative, incompatible uses (preserve functions and maintenance operations) of historic Spring Hill / Z Bar Ranch Headquarters would be moved to the new visitor center, administrative, and maintenance facilities in the southern portion of the preserve. Materials currently stored in the historic structures (ranch house, barn, outbuildings) would be removed. These changes would reduce the current damaging load stress on structure

flooring, and would allow the National Park Service to maintain the historic consistency of the area. The beneficial effects would be minor to moderate and long term.

Cumulative Impacts. Past and present actions that have affected historic structures of the preserve include inadvertent vandalism, visitor use resulting in wear and tear, natural processes, the Bottomland Trail project in the corral area, and urban development outside the preserve. Overall cumulative impacts from past, present, and reasonably foreseeable actions would be long-term, adverse, and minor. The no-action alternative would contribute a long-term, minor, beneficial, cumulative impact to historic structures.

Conclusion. Minor to moderate, long-term, beneficial effects to historic structures would be realized by moving visitor services and operational functions out of the historic buildings and cultural landscape. Cumulative impacts would be long-term, minor, and adverse, and the contribution of the no-action alternative would be minor and beneficial.

Section 106 Summary. Under 36 CFR 800, *Protection of Historic and Cultural Properties*, “an undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.” Under the no-action alternative, there would be no changes to historic structures. After applying the Advisory Council on Historic Preservation’s criteria of adverse effect (36 CFR 800.5), the National Park Service determined that the activities proposed in the no-action alternative would have no adverse effect to historic structures.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve’s establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve’s GMP or other relevant NPS planning documents, impairment of historic structures would be unlikely.

Archeology

There are no known archaeological resources within the area currently designated as visitor information and orientation (Jones 1999). If, during construction, any previously unknown archeological resources are discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed, in consultation with the Kansas SHPO and other appropriate consulting parties, including affiliated tribes. Therefore, the no-action alternative would have no or negligible impacts on archaeological resources.

Cumulative Impacts. It would be expected that past development in the surrounding region has damaged archeological resources. Past, present, and reasonably foreseeable future projects with the potential to affect archeological resources include the possible construction of trails, roads, and use of ranch headquarters by visitors and preserve employees. The no-action alternative would not contribute to cumulative impacts.

Conclusion. The no-action alternative would have no or negligible impacts on archeological resources, nor would it contribute to cumulative impacts.

Section 106 Summary. Under 36 CFR 800, *Protection of Historic and Cultural Properties*, “an undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.”

Under the no- action alternative, there would be no changes to archeological resources. After applying the Advisory Council on Historic Preservation’s criteria of adverse effect (36 CFR 800.5), the National Park Service determined that the activities proposed in the no- action alternative would have no adverse effect on archeological resources.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve’s establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve’s GMP or other relevant NPS planning documents, impairment of archeological resources would be unlikely.

Cultural Landscapes

The proposed development site for the no- action alternative is located on the southern boundary of the preserve near the corral area of the cultural landscape. The construction of new facilities would introduce new uses and inconsistent elements into the cultural landscape; however, the integrity of this area has already been diminished by modification outside the local period of significance for the national landmark (Bahr Vermeer Haecker Architects 2004). Therefore, the new facilities would not interfere with the overall integrity of the cultural landscape. The effects of the no- action alternative on cultural landscapes would be long- term, minor, and adverse.

Removal of visitor services and administrative/maintenance functions from the historic Spring Hill / Z Bar Ranch Headquarters would benefit the cultural landscape. The beneficial effects would be minor and long- term.

Cumulative Impacts. Past and present actions that have affected the preserve’s cultural landscapes include visitor use, natural processes, the Bottomland Trail project in the corral area, and urban development and loss of tallgrass prairie outside the preserve. Reasonably foreseeable future actions that might affect cultural resources in the preserve include the future expansion of St. Anthony Cemetery and continued development outside the preserve, especially that which is predominantly visible from the cultural landscape. Overall cumulative impacts from past, present, and reasonably foreseeable actions would be long- term, minor to moderate, and adverse. The no- action alternative would have a long- term, minor, adverse, cumulative impact.

Conclusion. Impacts to cultural landscapes associated with development of the new facilities would be long- term, minor, and adverse. Minor, long- term, beneficial effects to cultural landscapes would be realized by moving visitor services and operational functions out of the historic buildings and this part of the cultural landscape. The no- action alternative would contribute a long- term, minor, and adverse cumulative impact.

Section 106 Summary. Under 36 CFR 800, *Protection of Historic and Cultural Properties*, “an undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.”

Under the no- action alternative, there would be no changes to cultural landscapes. After applying the Advisory Council on Historic Preservation criteria of adverse effect (36 CFR 800.5), the National Park Service determined that the activities proposed in the no- action alternative would have no adverse effect to cultural landscapes.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve’s establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve’s GMP or other relevant NPS planning documents, impairment of cultural landscapes would be unlikely.

Soils

New facilities would be constructed adjacent to the southern boundary of the preserve on a site that currently supports relatively intact tallgrass prairie habitat. This alternative would result in the direct loss and/or disturbance of the extant prairie soils. Water infiltration would decrease over the developed area and corresponding surface runoff and downslope soil erosion potential would increase, although facilities would be sited and designed to minimize such effects. Increased levels of soil erosion could result in increased rates of sedimentation to Fox Creek. Impacts due to surface runoff at higher velocity and soil erosion would be short- and long- term, adverse, and minor to moderate in intensity.

Soil horizons are characterized by a moderate shrink- swell potential, but occur over relatively shallow shale bedrock and are therefore not expected to adversely affect building foundations (USDA 1974).

Cumulative Impacts: A number of past and planned activities have or could affect soil condition and processes in and near the preserve. Historic grazing, for example, may have resulted in minor levels of soil compaction caused by physical trampling of soils. Soil compaction may be associated with degraded habitat for soil microorganisms, inhibited nutrient cycling, and reduced water infiltration rates following precipitation. Residential, commercial, and infrastructure construction, installation of a new water supply line for the preserve (recent past), and possible future expansion of St. Anthony Cemetery also result in impacts to soils. Overall cumulative impacts from past, present, and reasonably foreseeable actions would be local, long- term, minor to moderate, and adverse. Implementation of the no- action alternative would have a short- and long- term, minor to moderate, adverse contribution to cumulative impacts.

Conclusion. Impacts to soils from the no- action alternative would be short- and long- term, adverse, and minor to moderate in intensity. Cumulative impacts would also be short- and long- term, adverse, and minor to moderate. The contribution of the no- action alternative to cumulative impacts would be minor to moderate and adverse.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve's establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve's GMP or other relevant NPS planning documents, impairment of soils would be unlikely.

Prime and Unique Farmlands

The no- action alternative site for the new facilities is on farmland of statewide importance. The predominant soil is the Clime- Sogn complex, (3% to 20% slopes). Impacts would be associated with alteration and/or loss of as much as 8.0 acres of potential farmland. There would be no impacts to prime farmland from construction of new facilities on the no- action alternative site. There would be short- and long- term, site- specific, moderate impacts on farmland of statewide importance.

Cumulative Impacts. Past and present actions that have affected farmlands include conversion of the tallgrass prairie within the Southeastern Great Plains Tallgrass Prairie Ecological System to agriculture; nonnative hayfields; farmsteads, ranch operation centers, and corrals; urban areas; and infrastructure. Most recently, potential farmland within the preserve was disturbed by installation of a new waterline to provide potable water to the preserve. Any prairie restoration activities could also affect farmlands. Reasonably foreseeable future actions that would affect prime farmlands or farmlands of statewide importance include expansion of St. Anthony Cemetery. Cumulative impacts from past, present, and reasonably foreseeable actions would be long- term, negligible to minor, and adverse because of conversion of cultivated lands to natural tallgrass prairie or facilities. The no- action alternative site for the new facilities is on farmland of statewide importance and construction activities would contribute short- and long- term, minor, adverse, cumulative impacts.

Conclusion. There would be impacts related to removal and/or covering over of up to 8.0 acres of farmlands of statewide importance in constructing the proposed Tallgrass Prairie National Preserve facilities and utilities. However, of the 10,741 acres of prime farmlands and farmlands of statewide importance in the preserve, the proposed activities would directly affect only approximately 0.06% of these lands. The no- action alternative would result in short- and long- term, site- specific, moderate, adverse impacts to farmland of statewide importance. On a regional scale, however, this would have a negligible, long- term, adverse effect.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve's establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve's GMP or other relevant NPS planning documents, impairment of prime and unique farmlands would be unlikely.

Vegetation

The no- action alternative site for the new facilities is within the preserve and supports a tallgrass prairie ecological system mostly composed of native grasses including big bluestem, sideoats, grama, Indiangrass, buffalo grass, and little bluestem. Impacts would be associated with alteration and/or loss of as much as 8.0 acres of tallgrass prairie habitat. Nonnative plant species may increase locally due to increased transportation of seeds into the area and by disturbance of native vegetation and soils. Impacts to plant communities from construction of new facilities on the no- action site would be short- and long- term, adverse, and minor to moderate.

Cumulative Impacts. Past and present actions that have affected native plant communities include conversion of the tallgrass prairie within the Southeastern Great Plains Tallgrass Prairie Ecological System to agriculture, nonnative hayfields, farmsteads, ranch and feed lot operation centers, corrals, urban areas, and infrastructure. Most recently, tallgrass prairie within the preserve was disturbed by installation of a new waterline to provide potable water to the preserve. Reasonably foreseeable future actions that would affect the local plant communities include expansion of St. Anthony Cemetery. Overall cumulative impacts from past, present, and reasonably foreseeable actions would be long- term, moderate to major, and adverse due to loss of remnant tallgrass prairie habitat on a continental scale. The no- action alternative would contribute short- and long- term, minor, adverse impacts to cumulative impacts.

Conclusion. Adverse impacts to plant communities would be short and long term, and minor to moderate. Cumulative impacts to plant communities from past, present, and reasonably foreseeable actions would be long- term, moderate to major, and adverse. The contribution of the no- action alternative to cumulative impacts would be short- and long- term, minor, and adverse.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve's establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve's GMP or other relevant NPS planning documents, impairment of vegetation and tallgrass prairie would be unlikely.

Threatened and Endangered Species

The federally endangered Topeka shiner occurs in Fox Creek and three unnamed tributaries on the west side of the preserve. There would be no direct or indirect impacts to the tributaries or to the Topeka shiner from construction of the facilities under the no- action alternative.

The federally endangered Neosho madtom may occur in the Cottonwood River of which Fox Creek is a tributary. Neosho madtoms have not been found within the preserve.

The federally threatened bald eagle ranges over large areas and is an occasional transient to the preserve, but there are no known nesting sites in the vicinity. The potential sites for new facilities are not vital for bald eagle foraging or roosting. Construction- related activities and noise could potentially disturb bald eagles using areas near the construction site, but such impacts would be temporary (lasting only until construction is completed) and negligible.

No impacts to threatened, endangered, or candidate species, or species of special concern are anticipated from implementation of the no- action alternative.

Cumulative Impacts. Past and present actions that have affected native habitats of the preserve include conversion of the tallgrass prairie within the Southeastern Great Plains Tallgrass Prairie Ecological System to agriculture, nonnative hayfields, farmsteads, ranch and feed lot operation centers and corrals, urban areas, and infrastructure. Most recently, tallgrass prairie within the preserve was disturbed by installation of a new waterline to provide potable water to the preserve. Future actions in and near the preserve include highway construction and maintenance, trail construction and maintenance, watershed and stock pond development, stream alterations, de- watering, land management, and introduction of nonnative species that could impact endangered species or their riparian habitats. Cumulative impacts from past, present, and reasonably foreseeable actions would be long- term, minor to moderate, and adverse for the Topeka shiner and Neosho madtom. The no- action alternative would not contribute to cumulative impacts.

Conclusion. There would be no impacts to threatened or endangered species from the implementation of the no- action alternative. The no- action alternative would not contribute negative impacts to the cumulative impact scenario.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve's establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve's GMP or other relevant NPS planning documents, impairment of threatened or endangered species would be unlikely.

Wildlife

The no- action alternative site for the new facilities is within the preserve and supports tallgrass prairie habitats. The area supports migratory birds and small mammals, with larger mammals including deer occasionally using the habitats. Impacts would be associated with alteration and/or loss of up to 8.0 acres of tallgrass prairie habitat.

The greater prairie chicken is declining throughout the Midwest and occurs on lands of the preserve. Small mammals that use the site would be adversely affected through displacement, direct mortality, and habitat loss. Large construction equipment and the associated noise and disturbance may result in local, short- term, adverse effects to birds that use habitat in and adjacent to the proposed site. Impacts to wildlife from construction of new facilities on the no- action alternative site would be short- and long- term, adverse, and minor to moderate.

Cumulative Impacts. Past and present actions that have affected wildlife include conversion of native tallgrass prairie to agricultural lands and urban development outside the preserve. Reasonably foreseeable future actions that could affect wildlife include future expansion of St. Anthony Cemetery (from the loss of tallgrass prairie habitat near the preserve). Future actions in and near the preserve include highway construction and maintenance, trail construction and maintenance, watershed and stock pond development, stream alterations, de- watering,

land management, and introduction of nonnative species that could impact wildlife or their habitats. Overall cumulative impacts from past, present, and reasonably foreseeable actions would be long- term, major, and adverse due to loss of tallgrass prairie habitat on a continental scale. The no- action alternative would contribute short- and long- term, minor, adverse impacts to the cumulative impacts.

Conclusion. Impacts to wildlife would be short- and long- term, adverse, and minor to moderate. The contribution of the no- action alternative to cumulative impacts would be short- and long- term, adverse, and minor.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve's establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve's GMP or other relevant NPS planning documents, impairment of wildlife would be unlikely.

Visitor Experience/Appreciation

Under the no- action alternative, a visitor center and other operational facilities would be constructed near the intersection of SH 177 and U.S.50. Visitor information and orientation services, the amphitheater, gift and book sales, and offices would be moved from the ranch house to the new visitor center. This would reduce the frequent activity in the ranch house, making additional ranch house rooms available for display of historic furnishings and interpretation, and enhancing the historic setting.

Once the visitor transportation system envisioned by the 2000 GMP is in place, visitor vehicles and buses would no longer be parked at the ranch complex, during the prime visitor season (visitors would park at the new center and be shuttled to the ranch complex). Moreover, stored NPS vehicles, equipment, and materials would be moved to the new maintenance facility. These actions would enhance the historic ambiance of the ranch environment.

The new visitor center would be wheelchair accessible; however, removable ramps and other accommodations would continue to be required at the ranch house. The visitor center would include space for interpretive displays to communicate interpretive themes and educational messages. Outdoor options for visitors (picnicking, outdoor amphitheater) would be associated with the visitor center. The no- action alternative site would provide access to the Bottomland Trail via a new trail link.

The new visitor facilities at the no- action alternative site would provide improved information and orientation, interpretive services, and recreational opportunities compared to that which is currently available at the ranch house, resulting in long- term, major, beneficial impacts to visitor experience. However, the proximity of the new facilities to the Bottomland Trail could detract from the experiences of visitors using the trail, which would constitute a long- term, minor, adverse impact.

Cumulative Impacts. The Bottomland Trail was opened for use in 2003, widening the range of visitor opportunities available at this relatively new national park unit. The preserve also

recently implemented a living history program at the ranch house, and an outdoor symphony concert was held in the summer of 2006, with other visitor opportunities (more hiking and possible equestrian opportunities, etc.) planned for future years, as envisioned by the 2000 GMP. Overall, the cumulative impact of additional visitor opportunities would be long- term, moderate, and beneficial. The no- action alternative would contribute long- term, major, beneficial impacts to cumulative impacts.

Conclusion. The impacts of the no- action alternative to visitor experience/appreciation would be long- term, major, and beneficial, as would the contribution to cumulative impacts.

Scenic Quality

A new visitor center; administrative, maintenance, and transportation support facilities; and visitor and staff parking would be constructed along the southern boundary of the preserve. The no- action alternative site, which is located over 2 miles from the historic Spring Hill / Z Bar Ranch Headquarters, is difficult to see from the ranch. Much of the site is hidden by rolling hills, as verified by a computer- generated viewshed analysis conducted in 2003. The cemetery (located north of the no- action alternative site) serves to fragment the view from the ranch even more. The no- action alternative site is located in an area where other human- built features (e.g., St. Anthony Cemetery, the grain silo, and U.S. 50) are scarcely visible near the horizon. Because of the presence of these built features, the proposed facilities would blend into the surrounding landscape. The same characteristics would make the facilities inconspicuous from the high ridges within the preserve east of Fox Creek.

The no- action site is visible from the Bottomland Trail. A visitor center and other facilities constructed at the no- action site would be apparent to visitors using the trail, in large part because the site slopes toward the trail and the valley bottom with no intervening landscape. With thoughtful design, however, the visual impact of the facilities could be minimized.

Views from the site are relatively poor looking to the west and south. However, facilities could be designed and oriented to minimize these views, while highlighting exceptional views of tallgrass prairie and the cemetery to the north and bottomland forest to the east.

Considering most vantage points, impacts to scenic quality from construction of new facilities on the no- action site would be long- term, adverse, and minor with thoughtful siting and design (see figure 3 and mitigation for design criteria).

Cumulative Impacts. Past impacts on scenic quality in and around the preserve have mostly resulted from introduction of nonrural land uses and development such as U.S. 50 and the associated overpass and highway traffic, truck traffic on SH 177, and the KDOT highway materials site. Future actions could conceivably include additional urban or suburban development encircling the preserve, but such development is considered unlikely for the foreseeable future. Overall, cumulative impacts would be long- term, minor, and adverse, assuming that NPS facilities are designed to take best advantage of the exceptional views while minimizing less engaging ones. The no- action alternative would contribute long- term, minor, adverse impacts to cumulative impacts.

Conclusion. Impacts to scenic quality from developing facilities on the no- action alternative site would be long- term, adverse, and minor with thoughtful siting and design. The no- action alternative would make a long- term, minor, and adverse contribution to cumulative impacts.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve's establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve's GMP or other relevant NPS planning documents, impairment of scenic quality would be unlikely.

Water Quality

The no- action alternative site for the new facilities is within the preserve and supports a tallgrass prairie ecological system. Implementing the no- action alternative would remove much of the native vegetation and replace it with buildings, pavement, and native landscaping. The construction contract for the new facilities would stipulate compliance with a stormwater pollution prevention plan. With implementation of a stormwater pollution prevention plan, construction- related impacts to water quality (soil disturbance, sedimentation, and increased stormwater runoff) would likely be temporary, adverse, and negligible. The stormwater prevention plan would outline measures to slow, reduce and/or contain stormwater runoff, sedimentation, and release of contaminants. Following construction of the new facilities, impervious surfaces (parking lots, roofs, sidewalks, etc.) would cover much of the site, reducing stormwater permeation to subsurface soils. Stormwater runoff would increase and as a result, small quantities of contaminants including oil, antifreeze, and oxidized metals from visitor center parking areas would be transported in stormwater runoff into streams. Water quality impacts from changes in land use are expected to be long- term, adverse, and minor.

Cumulative Impacts. Regional urban, suburban, and rural development, with associated increased stormwater runoff, sedimentation, and introduction of contaminants into streams and rivers, has occurred locally. Future actions in and near the preserve include highway construction and maintenance, trail construction and maintenance, watershed and stock pond development, stream alterations, de- watering, land management, farming, ranching, and feed lot operations, and slight expansion of St. Anthony Cemetery. Overall cumulative impacts from past, present, and reasonably foreseeable actions would be long- term, minor to moderate, and adverse. The no- action alternative would contribute long- term, minor, adverse impacts to cumulative impacts.

Conclusion. Impacts to water quality from implementation of the no- action alternative would be long- term, minor, and adverse. The no- action alternative would contribute long- term, minor, adverse effects to cumulative impacts

Floodplains

The no- action site is located outside the 100- year floodplains of Fox Creek and the Cottonwood River (FEMA Flood Insurance Rate Map No. 200040- 0005B, 1990).

Prior to planning and design of the new facilities, a qualified hydrologist would delineate the 100- and 500- year floodplains to ensure that facility construction does not occur within floodplains. Hazardous materials storage areas and storage/display of curatorial items are class II actions and are required to be placed outside of or protected from the 500- year floodplain. The topography of the site indicates that it is possible to locate all facilities above the 100- year floodplain and to locate facilities outside of the 500- year floodplain (NPS, Smilie 2003b). Therefore, there would be no impacts to floodplains from the no- action alternative.

Cumulative Impacts. Regional urban and suburban development, with associated increased stormwater runoff and sedimentation has occurred locally. Future actions near the preserve could include additional highway and urban construction. Overall cumulative impacts from past, present, and reasonably foreseeable actions would be long- term, minor to moderate, and adverse. The no- action alternative would not contribute to cumulative impacts.

Conclusion. The no- action alternative would not result in impacts to floodplains, nor would it contribute to cumulative impacts.

Preserve Operations

Preserve operations would be consolidated at the new facilities complex. Daily communications and management would improve due to the proximity of the preserve management staff in one complex and the main visitor hub (the new visitor center and the historic Spring Hill / Z Bar Ranch Headquarters). Impacts to preserve operations would be long- term, beneficial, and minor to moderate.

Cumulative Impacts. As operations at the relatively new national park continue to expand, management responsibilities for the preserve staff would increase. The overall cumulative impact of the no- action alternative would be long- term, beneficial, and minor. The no- action alternative would contribute long- term, minor to moderate beneficial impacts to the cumulative impacts.

Conclusion. Impacts to preserve operations would be long- term, beneficial, and minor to moderate. The contribution of the no- action alternative to cumulative impacts would be beneficial, long- term, and minor to moderate.

ENVIRONMENTAL CONSEQUENCES—PREFERRED ALTERNATIVE

Space estimates for the buildings and structures are estimated at 1.7 acres for the combined visitor information and administrative center and 2.3 acres for the maintenance facilities (see table 2 in chapter 1). The management areas in the preferred alternative are proposed slightly larger to provide flexibility in layout and location of facilities. The management area for the visitor information and administrative center would be approximately 7.0 acres located south of the ranch headquarters along the west side of SH 177. The management area for the maintenance facilities would be approximately 6.0 acres along CR 227 located east of the sewage lagoons. The environmental consequences are analyzed for the entire proposed management area.

Historic Structures

Proposed Flint Hills Ranching Legacy Revision

Modifying the designation of this parcel from visitor information and orientation management area to Flint Hills ranching legacy area would not directly affect historic structures. Redesignation would exclude future major construction in this area, and any future indirect impact to the corral, resulting in a long- term, negligible to minor, beneficial impact on historic structures.

Proposed Visitor Center / Administration Parcel and Visitor Information and Orientation Area

Under the preferred alternative, incompatible uses (preserve functions and maintenance operations) of historic Spring Hill / Z Bar Ranch Headquarters would be moved to the new visitor center, administrative, and maintenance facilities in the southern portion of the preserve. Materials currently stored in the historic structures (ranch house, barn, outbuildings) would be removed. These changes would reduce the current damaging load stress on structure flooring, and would allow the National Park Service to maintain the historical consistency of the area. The impacts would be similar to the no- action alternative and beneficial, minor to moderate, and long- term.

Proposed Maintenance Parcel and Visitor Information and Orientation Area

Maintenance equipment and functions would be moved from the historic Spring Hill / Z Bar Ranch Headquarters to a new facility near the sewage lagoons. The impacts to the structures at ranch headquarters would be similar to the no- action alternative and long- term, beneficial, and minor to moderate.

The proposed maintenance facility site contains a historic corrugated steel barn used for storage that is located at the south boundary of the parcel. A low stone fence is built along the east side of the parcel and would not be impacted. The storage barn has been recommended for NRHP evaluation for determination of eligibility. The barn would likely be used to store preserve maintenance equipment and materials. Introduction of nontraditional uses into this area would impact this historic feature; however, the anticipated use is not dissimilar to the barn's original purpose. Use of the barn by preserve staff would ensure maintenance of the structure would be ongoing. There would be a long- term and negligible impact to historic structures in this area.

Cumulative Impacts. Past and present actions that have affected historic structures of the preserve include vandalism, visitor access, natural processes, the Bottomland Trail project in the corral area, and urban development outside the preserve. Reasonably foreseeable future actions that might affect historic structures of the preserve include future expansion of St. Anthony Cemetery and continued development outside the preserve, especially that which is visible from the cultural landscape. The past and present actions have resulted in a long- term

minor, adverse impact to historic structures. The preferred alternative, including impacts at the visitor center and administrative site, the maintenance site, and the addition to the Flint Hills ranching legacy area, would contribute to cumulative impacts, and this contribution would be long- term, negligible to minor, and beneficial.

Conclusion. Impacts to historic structures associated with development of the new facilities would be long- term, minor, and adverse. Minor, long- term, beneficial impacts to historic structures would be achieved by moving visitor services and operational functions out of the historic buildings. The contribution of the preferred alternative to cumulative impacts would be long- term, negligible to minor, and beneficial.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve's establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve's GMP or other relevant NPS planning documents, impairment of historic structures would be unlikely.

Section 106 Summary. After applying the Advisory Council on Historic Preservation criteria of adverse effect (36 CFR 800.5), the National Park Service concludes that implementation of the preferred alternative would have no adverse impacts on historic structures at Tallgrass Prairie National Preserve.

Archeology

Proposed Flint Hills Ranching Legacy Area Revision

Modifying the designation of this parcel from visitor information and orientation management area to Flint Hills ranching legacy area would not directly affect archeological resources. Redesignation would exclude future major construction in this area, and any future direct or indirect impact to archeological resources. Therefore, impacts on potential archeological sites would be negligible.

Proposed Visitor Center / Administration Parcel and Visitor Information and Orientation Area

The proposed location of the visitor center contains evidence of past use and habitation that may or may not be associated with ranching activities. Subsurface features and artifacts relating to prehistoric and historic occupations may still be present. It has been recommended that limited preconstruction investigations, including remote sensing, should be undertaken to confirm that no other significant historic archeological material or features are present. There would be site- specific, long- term, negligible to minor, adverse impacts to archeological resources in this area.

If, during construction, any previously unknown archeological resources are discovered, work would be halted in the discovery area, the site secured, and preserve staff would consult according to 36 CFR 800.13 and, as appropriate, with the Kansas SHPO and the provisions of

the Native American Graves Protection and Repatriation Act of 1990. In compliance with the act, the National Park Service would also notify and consult concerned American Indian tribal representatives for the proper treatment of human remains, funerary, and sacred objects should these be discovered during the project. Inadvertent archeological discoveries would result in a long- term negligible to minor site- specific adverse impact, depending on the nature of the archeological find.

Proposed Maintenance Parcel and Visitor Information and Orientation Area

The proposed location of the maintenance facility was explored for archeological resources using limited shovel tests. No archeological materials were identified. Shovel tests also indicated the area has not been previously disturbed by construction, but has been previously disturbed by erosion. Construction in this parcel would be unlikely to adversely affect significant, unrecorded, subsurface archeological resources. No further investigations are recommended and no impacts are anticipated.

Cumulative Impacts. It is likely that past development in the surrounding region has damaged archeological resources. Past, present, and reasonably foreseeable future projects with the potential to affect archeological resources include ranching activities; ranch road maintenance; controlled burns of grassland; new urban and rural development, and proposed development of the new visitor center, administrative, and maintenance facilities. Visitors may inadvertently disturb unidentified archeological sites near roads, trails, and in other areas of the preserve through trampling, artifact collection, and recreational activities. The cumulative impact of these past, present, and reasonably foreseeable future actions would be long- term, minor to moderate, and adverse, depending on the resource and the significance of the site. The preferred alternative would contribute a long- term, negligible, adverse, cumulative impact to archeological resources.

Conclusion. With mitigation, the effect would be a long- term negligible to minor site- specific adverse impact, depending on the nature of the archeological find. The preferred alternative would contribute a long- term, negligible, adverse, cumulative impact to archaeological resources.

Section 106 Summary. Under the preferred alternative, mitigation for this parcel would be effective in reducing or eliminating potential impacts to the archeological site within the area of potential effect. If an inadvertent archeological site is discovered, the section 106 process would be initiated and the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5) would be applied, resulting in a determination of *no adverse effect*.

Cultural Landscapes

Proposed Flint Hills Ranching Legacy Area Revision

Modifying the designation of this parcel from visitor information and orientation management area to Flint Hills ranching legacy area would not directly affect the cultural landscape. Redesignation would exclude future major construction in this area, and any future direct or indirect impact to the landscape. This portion of the landscape is already impacted by human-made intrusions—highways and urban development. Therefore, impacts to the cultural landscape in the southern portion of the preserve would be long- term, negligible to minor, and beneficial.

Proposed Visitor Center / Administration Parcel and Visitor Information and Orientation Area

The cultural landscape would be directly and indirectly affected by the preferred alternative. Construction of the new visitor center, administrative, and maintenance facilities, parking areas, and visitor support facilities would remove visitors and preserve operations from the historic Spring Hill / Z Bar Ranch Headquarters, which would benefit the cultural landscape. Concurrently, construction of modern nontraditional use facilities in the historic rural landscape would have an adverse impact on pasture that is a component of the cultural landscape and a national historic landmark. The preferred alternative development site is on the west side of SH 177, and within a previously disturbed area. This new construction would result in a major, long- term adverse impact to the cultural landscape and national historic landmark. The new visitor information and administrative center would be designed to blend into and harmonize with the character of the landscape and be as visually unobtrusive as possible. Design treatments and criteria are included in mitigation measures in chapter 2. Incorporating these mitigation measures would reduce the overall impact to the landscape and national historic landmark; and therefore, the effects of the preferred alternative on cultural landscapes would be long- term, moderate, and adverse.

Proposed Maintenance Parcel and Visitor Information and Orientation Area

The cultural landscape would be indirectly affected by construction of the maintenance facility. The proposed location is next to the Strong City sewage lagoons. The cultural landscape in that area has been previously disturbed; therefore, the effects of construction of the proposed maintenance facility would be long- term, minor, and adverse.

Cumulative Impacts. Past and present actions that have affected cultural landscapes of the preserve include visitor access and urban development outside the preserve. Reasonably foreseeable future actions that might affect cultural landscapes in the preserve include construction of the new visitor center, administrative, and maintenance facilities; future expansion of St. Anthony Cemetery; and continued development outside the preserve, especially that which is visible from the cultural landscape. These actions have resulted in a long- term, minor to moderate, adverse impact to cultural landscapes. The preferred

alternative would contribute a long- term, adverse, and moderate, cumulative impact to cultural landscapes.

Conclusion. Impacts to cultural landscapes associated with development of the new facilities would be long- term, moderate, and adverse. Minor, long- term, beneficial effects to cultural landscapes would be achieved by removing visitor services and operational functions from the historic buildings and the cultural landscape of the historic Spring Hill / Z Bar Ranch Headquarters. The contribution of the preferred alternative to cumulative impacts would be long- term, moderate, and adverse.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve's establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve's GMP or other relevant NPS planning documents, impairment of cultural landscapes would be unlikely.

Section 106 Summary. After applying Advisory Council on Historic Preservation criteria of adverse effect (36 CFR 800.5), implementation of the preferred alternative could have an adverse effect on cultural landscapes at Tallgrass Prairie National Preserve. The National Park Service should consult with the Kansas SHPO during the design phase to ensure adverse impacts to the cultural landscape are minimized.

Soils

Proposed Flint Hills Ranching Legacy Area Revision

Modifying the designation of this parcel from visitor information and orientation management area to Flint Hills ranching legacy area would not directly affect soils. Redesignation would exclude future major construction in this area, and any future direct and indirect impacts to soils. The redesignation would remove a net gain of 68.0 acres from potential future construction resulting in localized, long- term, minor, beneficial impacts.

Proposed Visitor Center / Administration Parcel and Visitor Information and Orientation Area

New facilities would be constructed in a previously disturbed area—the former location of ranch buildings that have since been removed. Soil disturbance is apparent by the invasion of nonnative plant species. While most of the parcel has been disturbed, it is possible that isolated areas of undisturbed soils would be adversely impacted as a result of construction. Approximately 4.4 acres would be permanently affected by construction of the new visitor center, administrative facility, and parking areas. In addition, some increased soil compaction could occur as a result of increased visitation to the area. However, that compaction would occur in concentrated, previously disturbed, high- traffic areas; therefore, impacts to soils would be localized, short- and long- term, negligible to minor, and adverse.

Soil horizons are characterized by a moderate- to- high shrink- swell potential, which would adversely impact building foundations. Proper engineering, design, and construction would be required to reduce adverse impacts to a negligible to minor designation.

Proposed Maintenance Parcel and Visitor Information and Orientation Area

The maintenance facility and grounds would be constructed adjacent to the existing sewage lagoons. This area has been previously disturbed and soils were impacted during construction of the lagoons. It is possible there may be small isolated areas of undisturbed soils that have not been impacted by the previous construction activity. Increased vehicle and pedestrian traffic would result in soil compaction over the long term. Approximately 2.8 acres would be permanently affected by the construction of the maintenance facility and parking areas. The impacts to soils would be localized, short- and long- term, negligible to minor, and adverse. Soil horizons are characterized by a moderate- to- high shrink- swell potential that would adversely impact building foundations. Proper engineering, design, and construction would be required to reduce adverse impacts to a negligible to minor designation.

Cumulative Impacts: Past and ongoing activities have affected or could potentially affect soil conditions and processes in and near the preserve. Historic grazing may have resulted in minor soil compaction caused by physical trampling of the soil. Construction in the surrounding area of the preserve, installation of a new water supply line (recent past), and possible future expansion of St. Anthony Cemetery all contribute to a long- term minor to moderate impact to soils. The contribution to cumulative impacts of the visitor center and administrative and maintenance sites of the preferred alternative would be long- term, negligible, and adverse. The addition to the Flint Hills ranching legacy area would contribute long- term, negligible to minor, beneficial impacts to cumulative impacts.

Conclusion: Impacts to soils and soil processes would be localized, short- and long- term, adverse, and negligible to minor. Cumulative impacts to soils would be long- term minor and adverse. The contribution of the preferred alternative to cumulative impacts would be long- term, negligible, and adverse at the visitor center, and long- term, negligible, and beneficial at the Flint Hills ranching legacy area.

Prime and Unique Farmlands

Proposed Flint Hills Ranching Legacy Revision

Modifying the designation of this parcel from visitor information and orientation management area to Flint Hills ranching legacy area would not directly affect prime farmlands. The site soils are the Clime- Sogn complex, which is considered farmland of statewide importance. Redesignation would preclude future major construction on 68.0 acres, resulting in no impact to prime farmlands and localized, long- term, minor, beneficial impacts to farmland of statewide importance. This soil type is likely within the 500- year floodplain.

Proposed Visitor Center / Administration Parcel and Visitor Information and Orientation Area

The preferred alternative would result in direct and indirect impacts to prime farmlands. The site includes one soil type considered prime farmland: Martin silty clay loam, 3% to 7% slopes.

Facilities would be constructed on the proposed visitor center / administrative parcel and visitor information and orientation area abutting the west right- of- way of SH 177.

Approximately 4.4 acres of prime farmland soils would be disturbed due to construction of the new visitor center, administrative facilities, visitor parking area, amphitheater, and outdoor exhibits, and trails. Potential farmland would be removed during earthwork to support facility construction, trenching for utilities, and paving. Of the preserve's 10,894 acres, 10,741 acres are classified as prime farmlands or farmlands of statewide importance. The preferred alternative would affect 4.4 designated acres and would result in short- and long- term, site- specific, moderate, adverse impacts to prime farmlands.

Proposed Maintenance Parcel and Visitor Information and Orientation Area

Facilities would be constructed on the proposed maintenance parcel and visitor information and orientation area located on the east boundary of the Strong City sewage lagoons. The site is composed almost entirely of Martin silty clay loam, 3% to 7% slopes, and is considered prime farmland. Currently, approximately 500 acres along Fox Creek on the preserve are leased for brome hay production. Approximately 2.8 acres of prime farmland would be disturbed. Prime farmland would be removed during earthwork to support facility construction, trenching for utilities, and paving. The preferred alternative would result in short- and long- term, site- specific, moderate, adverse effects to prime farmlands.

Cumulative Impacts. Past and present actions that have affected farmlands include conversion of the tallgrass prairie within the Southeastern Great Plains Tallgrass Prairie Ecological System to agriculture; farmsteads, ranch operation centers, and corrals; urban areas; and infrastructure. Most recently, potential farmlands within the preserve was disturbed by installation of a new waterline to provide potable water to the preserve. Reasonably foreseeable future actions that would affect prime farmlands or farmlands of statewide importance include expansion of St. Anthony Cemetery. Cumulative impacts from past, present, and reasonably foreseeable actions would be long- term, negligible to minor, and adverse because of conversion of cultivated lands to natural tallgrass prairie. The visitor center and administrative site aspect of the preferred alternative would contribute a long- term, negligible to minor, adverse impact. The addition to the Flint Hills ranching legacy area would contribute long- term, negligible to minor, beneficial impacts. The maintenance site would contribute long- term, negligible to minor, adverse impacts.

Conclusion. There would be impacts related to removal and covering over of approximately 7.2 acres of prime farmlands in constructing the proposed Tallgrass Prairie National Preserve facilities and utilities. However, of the 10,741 acres of prime farmlands and farmlands of statewide importance in the preserve, the proposed activities would directly affect 0.06% percent of farmlands so designated. The preferred alternative would result in short- and long-

term, site- specific, moderate, adverse impacts to prime farmlands. On a regional scale, this would have a negligible, long- term, adverse effect.

Impairment. The preferred alternative would result in short- and long- term, site- specific, moderate, adverse impacts and a regional, negligible, long- term, adverse impact to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve's establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve's GMP or other relevant NPS planning documents. Because the consequent impact levels range from negligible to moderate, impairment of prime farmlands and farmlands of statewide importance would be unlikely.

Vegetation

Proposed Flint Hills Ranching Legacy Area Revision

Modifying the designation of this parcel from visitor information and orientation management area to Flint Hills ranching legacy area would not directly affect vegetation resources. Redesignation would preclude future major construction in this area, and associated future direct and indirect impacts to vegetation. The redesignation would remove 68 acres from potential future construction. This action would result in localized, long- term, minor to moderate, beneficial impacts to native tallgrass prairie vegetation.

Proposed Visitor Center / Administration Parcel and Visitor Information and Orientation Area

The preferred alternative would result in direct and indirect impacts on existing native and nonnative vegetation and on elements of the Southeastern Great Plains Tallgrass Prairie Ecological System occurring adjacent to and within the preserve.

Facilities would be constructed on the proposed visitor center / administrative parcel and visitor information and orientation area abutting the west right- of- way of SH 177. Approximately 4.4 acres of moderately aged trees and native, mixed, and nonnative prairie vegetation would be disturbed due to construction of the new visitor center, administrative facilities, visitor parking area, amphitheater, outdoor exhibits, and trails. The mixed native and nonnative vegetation would be removed during earthwork to support facility construction, trenching for utilities, and paving. Small areas of landscaping using native plant species would occur on temporarily disturbed sites and in planned landscaping elements following earth preparation and construction. The preferred alternative would result in short- and long- term, site- specific, minor, adverse impacts to native tallgrass prairie, mixed tallgrass prairie, and nonnative vegetation.

Proposed Maintenance Parcel and Visitor Information and Orientation Area

Facilities would be constructed on the proposed maintenance parcel and visitor information and orientation area site located on the east boundary of the Strong City sewage lagoons. Approximately 2.8 acres of dense, nonnative smooth brome hay meadow would be disturbed. There would be no impacts to the stand of riparian trees located on the eastern boundary of this site (occurs with the historic stone fence along the wooded hillside). The nonnative vegetation would be removed during earthwork to support facility construction, trenching for utilities, and paving. Small areas of landscaping using native species would occur on temporarily disturbed sites and in planned landscaping elements following earth preparation and construction. The preferred alternative would result in short- and long- term, site- specific, negligible, adverse effects to nonnative vegetation.

Cumulative Impacts. Past and present actions that have affected native plant communities include conversion of the tallgrass prairie within the Southeastern Great Plains Tallgrass Prairie Ecological System to agriculture; nonnative hay meadows; farmsteads, ranch and feed lot operation centers, and corrals; urban areas; and infrastructure. Recently, tallgrass prairie within the preserve was disturbed by installation of a new waterline to provide potable water to the preserve. Reasonably foreseeable future actions that would affect plant communities include expansion of St. Anthony Cemetery. Cumulative impacts from past, present, and reasonably foreseeable actions would be long- term, moderate to major, and adverse because of loss of disturbed elements of remnant tallgrass prairie habitat on a continental scale. The visitor center and administrative site aspect of the preferred alternative would contribute a long- term, negligible, adverse impact. The addition to the Flint Hills ranching legacy area would contribute long- term, negligible to minor, beneficial impacts. The maintenance site would make no contribution because the impacts to vegetation are negligible.

Conclusion. There would be impacts related to removal and covering over of approximately 7.3 acres of mixed native/nonnative and nonnative plant communities due to construction of the proposed facilities and utilities. However, 68 acres of tallgrass prairie would be preserved, resulting in a minor, long- term, beneficial effect. Cumulative impacts to tallgrass prairie from conversion to agriculture, nonnative pastures, farmsteads, ranch operation centers and corrals, urban areas, and infrastructure would be long- term, adverse, and moderate to major. The preferred alternative would contribute long- term, negligible to minor, beneficial impacts.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve's establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve's GMP or other relevant NPS planning documents, impairment of vegetation and tallgrass prairie would be unlikely.

Threatened and Endangered Species

Proposed Flint Hills Ranching Legacy Area Revision

Modifying the designation of this parcel from visitor information and orientation management area to Flint Hills ranching legacy area would not directly affect threatened and endangered species. Redesignation would exclude future major construction in this area, and any future direct and indirect impacts to threatened and endangered species. The redesignation would remove 68.0 acres from potential future construction. Threatened and endangered species and their habitats would not be directly or indirectly affected by this alternative.

Proposed Visitor Center / Administration Parcel and Visitor Information and Orientation Area

The preferred alternative would not result in direct impacts to the Topeka shiner, Neosho madtom, or bald eagle. All three species use aquatic and riparian habitats. The Topeka shiner occurs in the tributary immediately south of the preferred alternative site. The Neosho madtom occurs downstream of the preserve in the Cottonwood River. The bald eagle may use (no documented nesting) riparian gallery forests lining Fox Creek as it flows through the preserve, and the Cottonwood River, downstream from the preserve. The preferred alternative would not construct the visitor center and associated parking areas within the riparian habitats of these waterways. No riparian gallery forest habitat is planned for removal. There would be no fill placement in or dredging of wetlands or other waters of the United States.

Indirect impacts to threatened or endangered species may include sediment releases from the construction site as a short-term, negligible to minor, adverse impact. Sediment releases could also occur following construction from runoff over unpaved parking areas or from impervious surfaces. Impacts due to sediment transport would be long-term, negligible to minor, and adverse. Impacts are mitigatable during construction, sediment release can be controlled through proper placement and maintenance of silt fencing, or other appropriate devices. Long-term adverse impacts due to sediment releases may be mitigated by using appropriately sized stormwater retention/detention structures. The structures would be designed to release runoff water via infiltration or evapotranspiration, avoiding direct runoff, sedimentation, and pollutant transport to Fox Creek and its tributaries.

Construction-related noise could disturb bald eagles using areas near the construction sites for foraging or roosting (there are no documented nest sites in the preserve at or near the construction sites). Noise impacts would be short term (lasting only until construction is completed) and negligible.

Proposed Maintenance Parcel and Visitor Information and Orientation Area

The preferred alternative would result in construction of the maintenance facility and associated parking areas. No riparian gallery forest is planned for removal. Riparian vegetation would not be directly disturbed by the preferred alternative. There would be no fill placement in or dredging of wetlands or other waters of the United States.

Indirect impacts to threatened and endangered species may include sediment releases from the construction site as described for the visitor center and parking areas. These impacts would be short term, negligible to minor, and adverse. During construction for the maintenance facility, sediment release could be controlled as described for the visitor center. This can be accomplished through proper placement and maintenance of silt fencing or other appropriate barriers, and placement of appropriately sized stormwater retention/detention structures. The structures would be designed to release runoff water via infiltration or evapotranspiration, avoiding direct runoff, sedimentation, and pollutant transport to Fox Creek and its tributaries or to the Cottonwood River.

Construction-related noise could disturb bald eagles using areas near the construction sites for foraging or roosting (there are no documented nest sites in the preserve at or near the construction sites). Noise impacts would be short term (lasting only until construction is completed) and negligible.

Cumulative Impacts. Past and present actions that have affected native plant communities of the preserve include conversion of the tallgrass prairie within the Southeastern Great Plains Tallgrass Prairie Ecological System to agriculture, nonnative hayfields, farmsteads, ranch and feed lot operation centers and corrals, urban areas, and infrastructure. These conversions of land-use changes in local water practices, have altered the physical and biological characteristics of streams. The Topeka shiner is sensitive to permanent changes in habitat such as reduced water quality and increased water temperature. It is also sensitive to intensive, continuous grazing, which tends to reduce and trample streamside vegetation and increase the amount of silt and sediment in streams (Platts 1979). High fecal coliform counts in Fox and Palmer creeks reduce water quality and may result from runoff from heavily grazed hayfields (Department of Health and Environment Kansas Water Quality Assessment 1996 in NPS 2000a).

Most recently, tallgrass prairie within the preserve was disturbed by installation of a new waterline to provide potable water to the preserve. Future actions in and near the preserve include highway construction and maintenance, trail construction and maintenance, watershed and stock pond development, stream alterations, de-watering, land management, and introduction of nonnative species that could impact endangered species or their riparian habitats. Cumulative impacts from past, present, and reasonably foreseeable actions would be long-term, minor to moderate, and adverse. The addition to the Flint Hills ranching legacy area aspect of the preferred alternative would not contribute adverse impacts to the cumulative impact scenario because there would be no impacts to threatened and endangered species. Construction of the new facilities at the visitor center and administrative and maintenance sites would adversely contribute to cumulative impacts. However, with appropriate mitigation measures, this contribution would be negligible.

Conclusion. There would be no direct effects to threatened or endangered species from the implementation of the preferred alternative at the preserve. There could be short- and long-term, negligible to minor, adverse impacts from sediment release as an indirect effect of the preferred alternative. These impacts could be readily avoided, minimized, and/or mitigated through use of best management practices for control of sediments and careful siting of stormwater retention/detention structures. Past, present, and reasonably foreseeable future actions would result in long-term, minor to moderate, adverse impacts. With appropriate mitigation measures, the preferred alternative would not contribute negligibly to the cumulative impact scenario.

Wildlife

Proposed Flint Hills Ranching Legacy Area Revision

Modifying the designation of this parcel from visitor information and orientation management area to the Flint Hills ranching legacy area would not directly affect wildlife habitat. Redesignation would preclude future major construction in this area, and any future direct and indirect impacts. The redesignation would remove 68.0 acres from potential future construction. This redesignation would result in a long-term, negligible to minor, beneficial impact to wildlife.

Proposed Visitor Center / Administration Parcel and Visitor Information and Orientation Area

Construction associated with the preferred alternative would have short-term, site-specific, negligible, adverse impacts to wildlife habitat. The habitat of the preferred alternative site is comprised of a mix of nonnative and native vegetation. This alternative would result in site-specific, localized, short-term, negligible to minor, adverse, and long-term, site-specific, negligible, adverse impacts to wildlife species and habitat.

Proposed Maintenance Parcel and Visitor Information and Orientation Area

The area proposed to support construction of the maintenance area is disturbed with nonnative vegetation as wildlife habitat. Construction of the maintenance facility would result in localized, short-term, negligible, adverse impacts to wildlife during construction, and localized, long-term, negligible, adverse effects due to the maintenance facility replacing habitat.

Cumulative Impacts. Past and present actions that have affected wildlife include conversion of native prairie to agricultural lands and urban development outside the preserve. Reasonably foreseeable future actions that could affect wildlife include future expansion of St. Anthony Cemetery and additional loss of tallgrass prairie habitat near the preserve. Cumulative impacts to wildlife from past, present, and reasonably foreseeable actions in and near the preserve would be long-term, adverse, and moderate to major as a result of the loss of tallgrass prairie habitat on a continental scale. The preferred alternative would result in a long-term,

negligible, adverse impact on wildlife where construction is proposed, and long- term, negligible to minor, beneficial impact on wildlife with the addition of acreage in the Flint Hill ranching legacy area.

Conclusion. Impacts to wildlife associated with this alternative from construction of new facilities would be short and long- term, negligible to minor, and adverse. Cumulative impacts to wildlife from conversion to agriculture and urban development would be long- term, moderate to major, and adverse. The preferred alternative would contribute negligibly to cumulative impacts.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve's establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve's GMP or other relevant NPS planning documents, impairment of wildlife would be unlikely.

Visitor Experience/Appreciation

Proposed Flint Hills Ranching Legacy Area Revision

Modifying the designation of this parcel from visitor information and orientation management area to Flint Hills ranching legacy area would not directly affect visitor use and experience. Redesignation would exclude future major construction in this area, and therefore keep the Bottomland Trail secluded and natural. This would result in a long- term, negligible, beneficial impact.

Proposed Visitor Center / Administration Parcel and Visitor Information and Orientation Area

Under the preferred alternative, a visitor center and other new visitor facilities would be constructed within 1,000 feet of the historic Spring Hill / Z Bar Ranch Headquarters. Visitor information and orientation services, the amphitheater, gift and book sales, and offices would be moved from the ranch house complex to the new visitor center. This would reduce the frequent distracting activity in the ranch house, make additional ranch house rooms available for display of historic furnishings and interpretation, and improve the historic setting.

The new visitor center would be wheelchair accessible, so removable ramps would not be needed for disabled visitors seeking information and orientation services. (Accessibility accommodations would still be required at the ranch house.) The visitor center would include space for interpretive displays, providing improved communication of interpretive themes and educational information to visitors. Outdoor options for visitors (picnicking, outdoor amphitheater) would be associated with the visitor center, if space allows. The preferred alternative site would provide excellent access to backcountry trails.

The preferred alternative would provide improved orientation, information, interpretive services, and recreational opportunities, resulting in long- term moderate beneficial impacts to

visitor experience. The new visitor center would be the staging area for the public shuttle system, thereby providing an enhanced connection to the prairie tours. Overall, effects to visitor experience would be long- term, moderate, and beneficial.

Proposed Maintenance Parcel and Visitor Information and Orientation Area

Visitor vehicles and buses would no longer be parked at the ranch complex. Moreover, stored NPS vehicles, equipment, and materials would be moved to the new maintenance facility. These actions would enhance the historic ambiance of the ranch environment, and would result in a long- term, negligible to minor, beneficial impact on visitor experience.

Cumulative Impacts. The Bottomland Trail opened for use in 2003, expanding the range of visitor opportunities available at the preserve. The preserve recently implemented a living history program at the historic Spring Hill / Z Bar Ranch Headquarters. An outdoor symphony concert was held in the summer of 2006. Other visitor opportunities would be added in future years, as envisioned by the GMP. Combined with these additional visitor opportunities, impacts would be long- term, beneficial, and moderate. The contribution of the visitor center and administrative site aspect of the preferred alternative to cumulative impacts would be moderate. The contribution of the maintenance site aspect of the preferred alternative to cumulative impacts would be negligible to minor. The addition to the Flint Hills ranching legacy area would make a negligible contribution to cumulative impacts

Conclusion. The impact of the preferred alternative to visitor experience would be long-term, moderate, and beneficial. Cumulative impacts would also be long- term, moderate, and beneficial, and the contribution of the preferred alternative would be moderate and beneficial.

Scenic Quality

Proposed Flint Hills Ranching Legacy Area Revision

Modifying the designation of this parcel from visitor information and orientation management area to the Flint Hills ranching legacy area would not directly affect scenic resources. Redesignation would exclude future major construction in this area. This area is visually impaired by the highway, traffic, and urban development. The redesignation, therefore, would result in a long- term, negligible, beneficial impact to scenic resources.

Proposed Visitor Center / Administrative Parcel and Visitor Information and Orientation Area

The visitor center and administrative facilities parcel would be located within 1,000 feet (less than 0.2 mile) from the historic Spring Hill / Z Bar Ranch Headquarters, and would be visible from most vantage points at the ranch headquarters. With thoughtful design, however, the visual impact of the facilities could be minimized. The parcel slopes south (away from the ranch headquarters) and buildings could be designed in low profile (built into slope, one story).

The parcel and subsequent facilities would be visible from the Flint Hills ranching legacy and day use areas. However, looking toward the site, visitors would also see the ranch headquarters and other development and alterations. These same characteristics would help make the facilities inconspicuous from the high ridges within the preserve, east of Fox Creek. Again, with thoughtful design, the visual impact of the facilities could be minimized. This parcel and facilities would be visible along SH 177 within 0.5 mile of the site. This parcel and facilities would also be visible from the bottomland area and the bluffs to the east, and elevated prairie to the west. This location is not visible from the west or east beyond 1.0 mile or from the north and south beyond 0.5 mile (appendix F).

The views from the site and facilities looking west would be of the prairie for approximately 0.5 mile before the topography obstructs the viewshed. Views to the south would also be of the prairie and a bluff with a silo approximately 2.0 miles away. Views to the north would be of the ranch headquarters, and views to the east are comprised of the bottomland prairie and bluffs.

Considering most vantage points, impacts to scenic quality from constructing new facilities on the preferred alternative site would be long- term, adverse, and moderate within the immediate vicinity of the parcel (see mitigation measures for design criteria and appendix F for viewshed analysis).

Proposed Maintenance Parcel and Visitor Information and Orientation Area

The maintenance facilities would be located adjacent to and east of the Strong City sewage lagoons along CR 277. This parcel is screened by forests on three sides. The day use management area to the north and east is elevated from the bottomlands and views of the maintenance area would be minimal.

Considering most vantage points, impacts to scenic quality from constructing new maintenance facilities on this parcel would be long- term, adverse, and negligible.

Cumulative Impacts. Past impacts on scenic quality in and around the preserve have resulted primarily from introduction of nonrural land uses and development. Foreseeable future actions could include development on adjacent private land, encouraged by the increased presence of preserve visitors. Assuming that NPS facilities are designed to take advantage of superior views while shielding inferior views, overall cumulative impacts would be long- term, minor, and adverse. The visitor center and administrative site aspect of the preferred alternative would contribute to cumulative impacts on scenic quality, and this contribution would be long- term, minor to moderate, and adverse. The maintenance site and addition to the Flint Hills ranching legacy area aspects of the preferred alternative would not contribute to cumulative impacts because their impacts to scenic quality were both negligible.

Conclusion. Impacts to scenic quality from developing facilities on the preferred alternative sites would be long- term, moderate, and adverse with thoughtful siting and design for the visitor center, and long- term, negligible, and adverse for the maintenance facility. The preferred alternative would make a long- term, minor to moderate, adverse contribution to cumulative impacts.

Impairment. Because there would be no major adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the preserve's establishing legislation, (2) key to the natural or cultural integrity of the preserve or to opportunities for enjoyment of the preserve, or (3) identified as a goal in the preserve's GMP or other relevant NPS planning documents, impairment of scenic quality would be unlikely.

Water Quality

Proposed Flint Hills Ranching Legacy Area Revision

Modifying the designation of this parcel from visitor information and orientation management area to the Flint Hills ranching legacy area would not directly affect water quality. Redesignation would exclude future major construction in the area, resulting in a long-term, negligible, beneficial impact to water quality.

Proposed Visitor Center / Administration Parcel and Visitor Information and Orientation Area

Under the preferred alternative, new preserve facilities would be constructed. With implementation of a stormwater pollution prevention plan, construction-related impacts to water quality (soil disturbance, sedimentation, and increased stormwater runoff) would be temporary, minor, and adverse. The stormwater prevention plan would outline measures to slow, reduce, and/or contain stormwater runoff, sedimentation, and release of contaminants. Following construction of the new facilities, the area of impervious surfaces (parking lots, roofs, sidewalks, etc.) would be greater, reducing infiltration to surface and subsurface soils, thus increasing stormwater runoff. Small quantities of contaminants such as oil and antifreeze from visitor center parking areas would be absorbed into or transported by stormwater runoff and washed into a retention/detention structure (see mitigation section). Water quality impacts are expected to be short- and long-term, minor, and adverse.

Proposed Maintenance Parcel and Visitor Information and Orientation Area

A new maintenance facility would be constructed near the Strong City sewage lagoons as part of the preferred alternative. With implementation of a stormwater pollution prevention plan, construction-related impacts to water quality (soil disturbance, sedimentation, and increased stormwater runoff) would be temporary, negligible, and adverse. The stormwater prevention plan would outline measures to slow, reduce, and/or contain stormwater runoff, sedimentation, and release of contaminants. Following construction of the new facilities, the area of impervious surfaces (parking lots, roofs, sidewalks, etc.) would be greater, reducing infiltration to subsurface soils and thus increasing stormwater runoff. Small quantities of contaminants such as oil and antifreeze from maintenance and visitor parking areas, would be absorbed into or transported by stormwater runoff and washed into a retention/detention structure. Water quality impacts are expected to be long-term, negligible to minor, and adverse. Impacts to water quality from construction on the proposed maintenance facility parcel would be short- and long-term, negligible, and adverse.

Cumulative Impacts. Regional urban, suburban, and rural development with associated increased stormwater runoff, sedimentation, and introduction of contaminants into streams and rivers has occurred. Future actions in and near the preserve include highway construction and maintenance, trail construction and maintenance, watershed and stock pond development, stream alternations, de-watering, land management, farming, ranching and feed lot operations, and slight expansion of St. Anthony Cemetery. Cumulative impacts on water quality would be long-term, minor to moderate, and adverse, depending on the rate of suburban and rural expansion.

The visitor center, administrative, and maintenance site plans of the preferred alternative would contribute to cumulative impacts on water quality that would be negligible to minor because mitigation measures would be implemented to reduce or prevent sedimentation and runoff into water courses. The addition to the Flint Hills ranching legacy area would not contribute to cumulative impacts since the impacts to water quality are negligible.

Conclusion. Impacts to water quality from the preferred alternative would be long-term, negligible to minor, and adverse. Cumulative impacts would be long-term, minor to moderate, and adverse. The preferred alternative's contribution to cumulative water quality impacts would be long-term, negligible to minor, and adverse.

Floodplains

Proposed Flint Hills Ranching Legacy Area Revision

Modifying the designation of this parcel from visitor information and orientation management area to the Flint Hills ranching legacy area would exclude future major construction in this area, resulting in no impacts to floodplains.

Proposed Visitor Center / Administration Parcel and Visitor Information and Orientation Area

The proposed visitor information and administration center parcel is not located within the floodplain; however, it is adjacent to the 100-year floodplain of an intermittent tributary of Fox Creek. All buildings would be located outside the 100-year floodplain. A qualified hydrologist would conduct a site visit to delineate the 100-year floodplain. Delineation would ensure that individual facilities are placed and protected according to NPS floodplain guidelines during the design phase. Because construction would be outside the floodplain, there would be no impacts.

Proposed Maintenance Parcel and Visitor Information and Orientation Area

A portion of the parcel proposed for the maintenance facility is located within the 100-year floodplain of Fox Creek. Prior to planning and design of the new facilities, a qualified hydrologist would delineate the 100- and 500-year floodplains to ensure that construction occurs outside of floodplains. Hazardous materials storage areas and storage/display of

curatorial items are class II actions and are required to be located outside of the 500- year floodplain or protected from the 500- year flood. Therefore, there would be no impacts to floodplains from the preferred alternative.

Cumulative Impacts. Regional urban, suburban, and rural development, with associated increased stormwater runoff and sedimentation, has occurred. Future actions near the preserve could include additional infrastructure, urban, and rural construction. Overall cumulative impacts from past, present, and reasonably foreseeable actions would be long-term, minor to moderate, and adverse. The preferred alternative would not contribute to cumulative impacts.

Conclusion. The preferred alternative would not result in impacts to floodplains, nor would it contribute to cumulative impacts.

Preserve Operations

Proposed Flint Hills Ranching Legacy Area Revision

Modifying the designation of this parcel from visitor information and orientation management area to the Flint Hills ranching legacy area would not change current management of the area, and therefore would have no impact on preserve operations.

Proposed Visitor Center / Administration Parcel, Maintenance Parcel and Visitor Information and Orientation Area

NPS operations would be consolidated at the new visitor information and administrative center and maintenance facilities. Daily management would improve due to the proximity of the new visitor center to the historic Spring Hill / Z Bar Ranch Headquarters, and the preserve's core natural and cultural resources. Facilities would be new, and the best available and affordable design and technologies would be incorporated. The new facilities and equipment would be secure. Impacts to preserve operations would be long- term, minor to moderate, and beneficial.

Cumulative Impacts. As operations at this relatively new national park unit continue to expand, management responsibilities for preserve staff will increase. The overall cumulative impact would be long- term, minor to moderate, and adverse, without adequate facilities. The visitor center and administrative site, and maintenance site aspects of the preferred alternative would contribute long- term, minor to moderate, and beneficial cumulative impacts. The addition to the Flint Hills ranching legacy area would not contribute to cumulative impacts because there were no impacts to preserve operations.

Conclusion. Impacts to preserve operations would be long- term, beneficial, and minor to moderate. Cumulative impacts would be long- term, minor to moderate, and adverse. The contribution of the preferred alternative to cumulative impacts would be long- term, minor to moderate, and beneficial.

